

CLAIMS

1. A system provided with a fuel processor for generating
5 hydrogen from a hydrocarbon compound and a combustion path,
along which the generated hydrogen is passed for combustion, and
in which combustion path at least one fuel cell is included for
at least generating electric energy and optionally heat through
10 combustion of the hydrogen generated by the fuel processor,
characterized in that the system is further provided with a
first heat exchanger and a second heat exchanger which, on the
one hand, are series included in the combustion path downstream
of the fuel cell, a first heating circuit in which the fuel cell
is included ,and a second heating circuit in which the fuel
processor is included, which first heat exchanger, on the other
15 hand, is included in the first heating circuit for exchanging
heat between the combustion path and the first heating circuit,
and which second heat exchanger, on the other hand, is included
in the second heating circuit for exchanging heat between the
20 combustion path and the second heating circuit.

2. A system according to claim 1, characterized in that the
system is further provided with a waste gas burner included in
the combustion path between the fuel cell and the second heat
25 exchanger.

Sub A > 3. A system according to claim 1 or 2, characterized in that
the system is further provided with an afterburner or boiler
burner included in the combustion path between the first and the
30 second heat exchanger.

4. A system according to claim 2 and 3, characterized in that
the fuel cell, waste gas burner, second heat exchanger,
afterburner and first heat exchanger are series connected.

5. A system according to claim 3 or 4, characterized in that the afterburner is further provided with a separate inlet for supplying a gas, such as natural gas.

5 6. A system according to any one of claims 2, 4 or 5, characterized in that the waste gas burner is further provided with at least one first inlet included in the combustion path and a second inlet for supplying air.

10 7. A system according to claim 6, characterized in that the system is arranged such that waste gas air originating from the fuel cell or air from elsewhere can be supplied to the waste gas burner.

Sub A
25 >8. A system according to any one of the preceding claims, characterized in that the fuel cell is provided with a first inlet connected with the fuel processor for supplying hydrogen to the fuel cell, a second inlet for supplying air to the fuel cell, a first outlet for discharging waste gas from an anode of the fuel cell and a second outlet for discharging waste gas air from a cathode of the fuel cell.

20 9. A system according to claims 7 and 8, characterized in that the first outlet of the fuel cell is connected with the first inlet of the waste gas burner included in the combustion path.

30 10. A system according to claim 9, characterized in that the second outlet of the fuel cell is connected with the afterburner for supplying waste gas air from the fuel cell to the afterburner.

35 11. A system according to claim 10, characterized in that via a control valve the second outlet is also connected with the second outlet of the waste gas burner to supply waste gas air to the waste gas burner.

Sub A₃ > 12. A system according to any one of claims 8-11, characterized in that the system is further provided with a controllable first bypass connection for bridging the first inlet and the first outlet of the fuel cell when starting up the system.

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13. A system according to claim 12, characterized in that the system is further provided with a second bypass connection for bridging the second inlet and the second outlet of the fuel cell when starting up the system.

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Sub A₄ > 14. A system according to any one of the preceding claims, characterized in that the system is further provided with a central heating circuit and a third heat exchanger for exchanging heat between the first heating circuit and the central heating circuit.

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16. A system according to claim 14, characterized in that the central heating circuit is provided with a heat exchanger included in the combustion path downstream of the first heat exchanger.

Sub A₅ >

20 16. A system according to claim 14 or 15, characterized in that the first heating circuit is designed as a reversible heating circuit in which a heat transport medium can be selectively pumped round in two directions.

25 17. A system according to claim 14, 15 or 16, characterized in that the system is further provided with a heat destroyer in the form of, for instance, a fin included in the first heating circuit between the fuel cell and the third heat exchanger for adjustably discharging heat from the first heating circuit when the fuel cell, in use, cannot be cooled sufficiently after starting up.

35 18. A system according to any one of the preceding claims, characterized in that the fuel processor is provided with

humidifying means for humidifying the hydrocarbons supplied to the fuel processor, which humidifier is included in the second heat exchanger for supplying heat to the humidifying means.

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